

EcoNZ@Otago

24

MARCH 2010

# Education matters for trust: An experiment

## FROM THE editor

### Welcome to Issue 24 of *EcoNZ@Otago*!

As most readers know already, *EcoNZ@Otago* is a magazine about contemporary economic issues, published by the University of Otago's Department of Economics.

The contents of the previous 23 issues of *EcoNZ@Otago* are listed at the back of this issue, and single issues are available on request (our addresses are below).

If there are any economic issues that you would like examined in a future issue of *EcoNZ@Otago*, please email your suggestions to econz@otago.ac.nz. Alternatively you can write to *EcoNZ@Otago*, Department of Economics, University of Otago, PO Box 56, Dunedin, 9054.

In this issue, we investigate the role of trust in reducing the costs of economic transactions and deepen our understanding of *opportunity cost*, a fundamental concept in Economics. We also look at this year's recipients of the highest award in the field of Economics, the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, and recognize the achievements of Economics students at the University of Otago. This issue also features short commentaries, called *Highlights*, which accompany each article.

Dan Farhat

### Alvin Etang

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Trust plays a pivotal role in economic development by reducing the costs of making transactions. It is possible to improve the welfare of an emerging economy by isolating the factors that improve trust and implementing policies that foster them. In this study, I find that primary schooling is associated with higher levels of trust. This indicates that there are added benefits from education subsidies above and beyond skill improvement.



### Why Trust Is Important

It has been argued that much of the economic backwardness of the world can be explained by a lack of trust (Arrow, 1972). Trust decreases transaction costs making more efficient transactions possible, whereas a prevalence of distrust in a society imposes a kind of tax on all forms of economic activity (Fukuyama, 1995).

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Several empirical studies have found a strong and positive correlation between estimated levels of trust and economic performance, indicating that trust does have a positive impact on societies' well-being. This observation raises an important question: if societies benefit from maintaining stable levels of trust, then what mechanisms can promote trust? Recent theoretical and experimental literature has produced some relevant insights into various mechanisms that have been shown to encourage trusting behaviour. Using an economic experiment, I focus on the extent to which primary school education is associated with higher levels of trust. This study indicates that education helps to increase trust, providing a rationale for a subsidy on schooling.

### The Experiment

This study analyses the correlation between education and trust using experimental data from a 'Trust Game'. In the Trust Game, subjects are divided into two groups: *senders* and *recipients*. Each sender is anonymously paired with a recipient. Senders are then given a sum of money and must decide how much of this money, if any, to transfer to the recipient. The amount of money transferred is tripled by the experimenter. The recipient must then decide how much of the money, if any, to return to the sender and the game ends. The recipient has no obligation to send any money back to the sender, but choosing to do so is an indication of *trustworthiness* or *reciprocity*. This trustworthiness is measured by the amount of money the recipient returns. *Trust* is defined as the willingness of the sender to be vulnerable to the actions of the recipient. Senders decide how much money to send based on the expectation that the recipient will share the wealth once the transferred funds are tripled, regardless of their ability to monitor or control the recipient. In other words, trust is defined as the sender's expectation of reciprocity from the recipient and is measured by the amount of money the sender chooses to transmit.

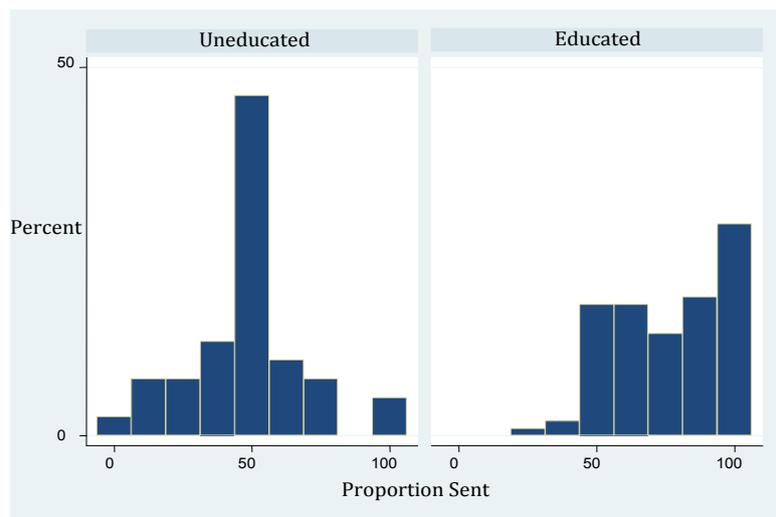
### The Case Study of Cameroon

In late 2008, I conducted the Trust Game in two adjacent villages in rural Cameroon. Everyone across the two villages belonged to the same ethnic group and spoke the same language. A total of 280 people participated in the study. The participants were evenly distributed between women and men. Many villagers had completed primary school; however, a significant number were illiterate. Each sender was given 800 CFA<sup>1</sup> francs and was asked to decide how much of the money, if any, to send to their corresponding recipient. 800 CFA francs was approximately half a day's wage for most villagers at the time of the experiment. Transfers could be made in 100 CFA franc units only. The value of the funds sent were tripled, the recipient then decided what proportion of the money (if any) to return to the sender, their decisions were recorded and the game ended.

### Results

The discussion of the empirical results from the data collected in Cameroon focuses on the main research question: do players who have completed primary school choose to send (or return) significantly different amounts of money in the Trust Game from players that are uneducated? The average proportion sent by all senders, regardless of whether they had completed primary school or not, was 68% of the 800 CFA francs endowment. When the sample is divided into educated and uneducated players, results suggest the educated senders send more. Figure 1 depicts the distribution of the share of funds sent by educated and uneducated senders. On average, the proportion sent by players who had completed primary school (referred to here to as the "educated") was 76%. The corresponding figure for those who had not completed primary education (referred to here to as the "uneducated") was 48%. The data indicate this difference is statistically significant, suggesting that the educated trust more.

Figure 1 – The proportion of money sent by educated and uneducated senders.



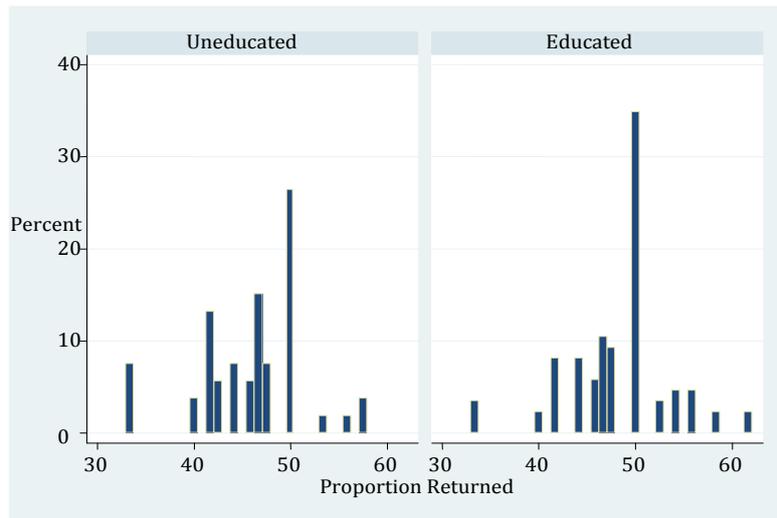
Analysing the behaviour of the recipients, the results show that no recipient returned less than 33% of the amount sent to them, regardless of their level of education. This indicates that senders generally received back at least as much as they sent in the first place. In fact, the vast majority of senders were better off as a result of transferring money. Therefore, the trusting behaviour of players that chose to send large shares was reciprocated. The average proportion returned by all the recipients was 47%, with a high proportion returning exactly half of what they were sent. When

<sup>1</sup> CFA franc stands for Communauté Financière Africaine (French for African Financial Community).

the sample is divided into educated and uneducated recipients, results suggest that the players' actions are similar despite differences in the amount of schooling they had obtained. Figure 2 shows the distribution of the share of funds returned by both educated and uneducated recipients. The average proportion returned was 48% for educated recipients and 46% for the uneducated. These figures are not significantly different from each other.

Finding that education is positively correlated with trust is similar to previous findings in Barr (2004), Haile *et al.* (2004), Karlan (2005), Helliwell and Putnam (2007), and Bellemare and Kröger (2003) who have all noted the positive effect of *higher education* on experimental trust. Results provided by conducting the Trust Game in Cameroon yield evidence about the impact of primary school education on trust. Even though most of the 'educated' villagers have completed only primary school, they still tend to be more trusting than uneducated persons. Policies promoting education, primary schooling in

Figure 2 – The proportion of money returned by educated and uneducated recipients.



particular, may help to increase the levels of trust among Cameroonians. While increased education improves economic performance by enhancing the skills of workers, an added benefit from increased trust is also acquired. In other words, students gain a sort of 'social capital' by interacting with other more trusting and trustworthy people at school, becoming more trusting themselves. Trust becomes a valuable by-product of education that is learnt in addition to 'human capital' or technical skills.

### Conclusion

The aim of this study was to test what effect education had on experimental trust. Although this is not the first study to analyse this question, mine is the first to analyse whether people who have completed *primary school* are more trusting than those who have not. The results show that education is positively correlated with trust: people who have completed primary school send more money in the Trust Game. To the extent that education is positively correlated with trust, which is believed to facilitate welfare-increasing interactions, policies that enhance the education of the population would have an increased impact on economic performance. Subsidizing education so as to encourage poor people to enrol in primary school not only increases the skills of workers, but may also result in higher levels of trust and better welfare at the community level. Thus, there is an external benefit from education, providing a rationale for a subsidy.

### Questions to consider

1. Apart from the trust and reciprocity motives, can you think of any other possible motives for sending and returning money in the Trust Game?

2. Do you think the educational effect will increase, the higher someone goes up the academic ladder? Why?

### Further reading

Details of this article are provided in Etang, Fielding and Knowles (2009).

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## HIGHLIGHTS:

## BYSTANDERS STANDING BY

Can you always trust your neighbours to do the right thing? In 1964, a woman named Kitty Genovese was killed in the courtyard of her apartment building in Queens, New York, during a brutal attack that lasted more than half an hour. Although as many as thirty-eight of her neighbours actually witnessed the attack, no one went to help her or even called the police. The story created a sensation and confirmed beliefs about the apathy of New Yorkers in the eyes of the public. While it might have seemed like those living in The Big Apple just don't care about their neighbours, the murder of Kitty Genovese was, in fact, an example of *diffusion of responsibility*, a phenomenon that occurs when a large number of people are called to make an action but cannot coordinate with each other.

The source of this phenomenon is that everyone believes that someone else *might* help. As a result, each person only helps with some probability and takes the chance that aid may be provided by another, known in economics as *free-riding*. This can occur even if the costs of providing help are low relative to the benefits that society receives from assistance being provided by at least one person. As the number of people in the community increases, any single person comes to believe that it is *more* likely that help will be provided by someone else, and thus reduces the probability they themselves help. This can cause the chances that aid is provided at all to *actually fall*. In large cities like New York, the likelihood that everyone expects someone else to call the police when crimes are committed can be high, showing that there is not always safety in numbers.

Some communities attempt to reduce the likelihood that crimes go unreported due to *diffusion of responsibility*. In California, for example, a witness responsibility act (AB 984) was passed in January, 2010, which requires witnesses to violent crimes to report them to the police. Not doing so is a punishable offence with up to 6 months in prison and a fine of US\$1500 (NZ\$ 2160). An economist might say that this sort of legislation may increase the number of crimes being reported as they occur, but can reduce the number of crimes reported later as witnesses may no longer be willing to clear their guilty consciences if they must plead guilty to a misdemeanour. Another alternative is to automate the "witnessing" process and install government-funded closed-circuit television (CCTV) monitoring programmes, as has been done extensively in the United Kingdom. Although CCTV comes with civil liberties issues, it has been shown to be a powerful crime deterrent and a useful tool for crime reporting. An economist might note, however, that digital monitoring may significantly reduce the likelihood a bystander reports a crime since they assume "Big Brother is always watching". Increased CCTV use in New Zealand's largest cities will most likely result in reduced crime, but will reduced crime reporting on behalf of human witnesses also occur?

Interested in the behaviour of bystanders? See page 14 for references and further reading.



# Will I, won't I? A hitch hiker's guide to opportunity cost

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Something must be sacrificed in order to gain something else. This idea, known as opportunity cost, is the core of economic decision-making and is central to the way the economy functions. Although opportunity cost is paramount to understanding the science of Economics, the topic is often inadequately explained in textbooks. In this article, I provide a fuller description of this concept then illustrate it in action in New Zealand and other economies.



## Introduction

Opportunity cost is a key concept in Economics and yet it receives scant coverage in most textbooks. Usually only about a paragraph is devoted to its definition along with an example or two, and then with a metaphorical sigh of relief, authors move on to other topics. In my opinion this is a mistake. Opportunity cost is fundamental to an understanding of the way in which economies work. In fact, this principle is the 'warp speed' motor of the market mechanism, so it really does deserve much more air time. In this article, I will provide a more detailed explanation of opportunity cost and highlight its practical uses in the New Zealand economy and elsewhere.

## What If?

The purpose of opportunity cost is to identify the cost of a transaction by reference to the next best alternative that may no longer be undertaken. In rhetorical terms, it is summarised by the question, 'what if I purchase A rather than B?' The resources used in buying A are no longer available to purchase B, therefore the cost of choosing A is

the lost opportunity to purchase B. Put another way, where there are scarce resources, the opportunity cost of any action is the sacrifice implied by not being able to execute an alternative. It captures the classic 'what if' conundrum that all economic agents face when making decisions. This 'what if' question is ubiquitous in Economics and is central to the valuation of assets.

## No Escape

Whenever resources are scarce, the opportunity cost principle operates. Something must always be sacrificed when something else is obtained. Even when the basis for allocation is not guided by prices or profits, there is no escape. In command economies where distribution decisions are determined by the central authorities and not by the market, such as the USSR during Stalin's regime and Cuba today, the brutal reality that alternatives are sacrificed cannot be sidestepped. These implied costs may not be obvious but they are certainly present. Like it or not, they cannot be circumvented.

## Opportunity Cost in Action

Figure 1 below helps to illustrate opportunity cost in action. It shows a limited range of activities that are available in a modern market-orientated economy. Each activity is ranked by perceived risk and expected return. The yield spectrum goes from a 0% return associated with very safe activities like holding cash, right up to high returns to be expected from hyper-risky activities like wildcatting for oil. Although the numbers attached are, of course, approximations, they do capture the essence of the trade off between perceived risk and expected return: the level of the expected return rises as the level of perceived risk increases.

Figure 1 – Risk and expected return of select market activities.

PERCEIVED RISK LEVEL	ACTIVITY	EXPECTED RETURNS % pa Averages
	Wildcatting for Oil	60
	Developing New Pharmaceuticals	40
	Venture Capital Investment	35
	Option and Futures Trading	25
	Own Business- Innovating	20
	Own Business – Non-innovating	17
	Public Private Partnerships	16
	Equity Shares	15
	State Owned Enterprises	14
	University Education	13
	Managed Funds	12
	Kiwi Saver Schemes	11
	Unit Trusts	10
	Preference Shares	9
	Debentures	8
	Local Authority Bonds	7
	Government Bonds	6
	Bank Medium-Term Deposits	5
Bank Short-Term Deposits	3	
<b>Official Cash Rate</b>	<b>2.5</b>	
Cash	0	

Figure 1 can be used to show the opportunity cost of one activity in terms of another. For example, suppose you chose to hold a sum of money in a short-term bank deposit in order to receive a 3% per-annum return. According to the figure, the opportunity cost of this action is the 5% per-annum return that you could have expected to receive on the next best alternative, which is represented as a medium-term bank deposit. Near the top of the scale, the opportunity cost of choosing to run one's own non-innovating business is 20% per-annum. This is the expected return on the next best alternative, which in my example is shown as choosing to run an innovating equivalent. Notice that in making the comparisons to determine opportunity cost, it is not the difference between the relevant rates of return but the absolute value of the expected return on the next best alternative.

So why is holding money in a medium-term bank deposit the next best alternative to holding money in a short-term bank deposit? Why is it not one of the other activities on the list that yield an even higher return, such as venture capital investment? Although more risky actions yield higher returns, risk-averse decision makers may not consider them better alternatives. Opportunity cost is dependent on the context of the decision taker. Joanne Bloggs may well function in the low risk zone whereas Warren Buffet or George Zorros are likely to view the world from well up the list where perceived risks are high.

## A Formal Definition and a Numerical Example

“The opportunity cost of an activity is the value of the next-best alternative that must be foregone to undertake the activity” (Frank and Bernanke, 2004). I have chosen this definition from many available in economics text books because of its precision. Also, these are the same authors that feature in the web address given below. There they test a sample of economists on their understanding of this central principle of their profession. The results are rather surprising.

Returning to the numbers presented in Figure 1 and assuming that medium-term bank deposits are the next-best alternative to short-term bank deposits, we are now able to put a numerical value on the opportunity cost. Imagine that you have a deposit of \$10,000 held at 3% per year in a short-term deposit at your bank. In a year’s time the interest earned will be \$300. If that same sum of money had been held as a medium-term bank deposit, then the interest after a year would have been \$500. The opportunity cost of your present decision to hold a short-term deposit is therefore \$500. This is the total value sacrificed by your present decision to hold the short term deposit. Notice that it is not the difference between the \$500 and \$300, namely \$200, nor is it the new aggregate sum at the year’s end of the hypothetical medium term bank deposit, which would be \$10,500.

## Performance Criterion and the Valuation of Assets

How does opportunity cost affect the valuation of assets? Opportunity cost determines what assets should earn by reference to the next best alternative. In this sense, it establishes a basis for comparing two similar assets. Consider, for example, investing in a publically traded company<sup>2</sup> by purchasing shares of a firm. When evaluating the opportunity cost of this action, the firm’s profit level must match the expectations established by ‘close by’ alternatives which are the profits earned by firms with similar characteristics. When the firm’s profit level falls short of the implied standard, there will be pressure for resources to move away to a better use. With a stock market listed company, this is likely to mean downward pressure on the share price, which occurs as investors sell their holdings in the company to invest elsewhere, and a drop in the value of the firm. With low entry and exit costs shareholders are able to shift resources quickly and cheaply to alternative uses, offering better returns. In effect, a major function of share markets is to add teeth to the opportunity cost mechanism. By providing daily valuations of shares, opportunity costs are made plain for all to see.

## Interdependence and the OCR

Another message from Figure 1 is the interdependent nature of activities. All uses of scarce resources are linked one to another because there is competition for their employment. When resources are used for one activity, they are, in a sense, taken away from other activities. If a new and highly profitable activity emerges, resources will flow towards it and away from other less attractive ventures. This causes valuation adjustments to ripple through the whole system.

For example, the expected returns for most of the market activities described in Figure 1 are heavily influenced by the official cash rate or OCR. This is the rate which the Reserve Bank sets autonomously to influence the cost of borrowing in New Zealand. The OCR is determined by the need to contain inflation and to manage the country’s level of economic activity. The rate chosen can vary by large amounts. In 2008, prior to the onset of the current recession, the OCR was at 8%. This has now been lowered to 2.5%. If the figure above had been compiled early in 2008, then the expected return levels would have looked very different. With an OCR of 8%, the rate of return on lending would be relatively high, implying that the return on other investment activities listed in Figure 1 would also be high.

## Will I Won’t I?

What determines whether I will or won’t change my current allocation of resources? From the paragraphs above it should be clear that opportunity costs are central to the process. Opportunity cost as revealed by a comparison with a ‘close by’ alternative is the pivot around which such decisions should be made. Before deciding if it is worthwhile to change to the next best opportunity, however, decision makers must ask themselves what the transaction costs of making the change are, what the risk level of the new use of resources is, and if the difference in the return available is worth the effort of moving resources around. However, a quick visit to the web address below will show that even for members of the Economics profession, it is very easy to trip up when applying the procedure.

## Questions to consider

1. Why should we care about opportunity costs? Suggest examples.
2. In what ways does opportunity cost apply to governments?

## Further reading

As an illustration of the Economics profession’s shortcomings in this area see:

<http://www.nytimes.com/2005/09/01/business/01scene.html>

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<sup>2</sup> A publically traded company issues stocks which are for sale to the public through a stock exchange.

## HIGHLIGHTS:

## PASSING ON PASSENGER VEHICLES

After the 1973 Arab Oil Embargo, the United States Congress enacted legislation designed to enforce energy conservation and reduce American reliance on petroleum products. One of these laws, the corporate average fuel economy (CAFE) standard, hoped to improve the fuel efficiency of cars and passenger trucks ("light trucks", which includes pickup trucks, vans, and SUVs) sold in the US. Under the CAFE standard, current model year fleets produced by automakers are required, on average, to meet a mandated miles-per-gallon (MPG) fuel economy minimum (currently 27.5 MPG for cars and 23.1 for light trucks). Falling to meet the standard results in a \$55 USD (\$76 NZD) fine per vehicle in the fleet for every 1 MPG the manufacturer falls below the requirement. Congress expected automakers to avoid these potentially large fines by producing increasingly fuel-efficient vehicles. As a result, there should have been a reduction in fuel consumption, lower transportation expenses for gas-saving consumers and a reduction in smog emissions. Unfortunately, a grim by-product from the CAFE legislation was skyrocketing transportation costs, pollution and death for some drivers.

After the emissions standards were set, automakers did in fact begin to produce more fuel-efficient vehicles. To do this, producers simply made lighter cars. By switching to more costly production methods using light-weight materials (such as plastics and aluminium), manufacturers managed to reduce vehicle weight by approximately 230 kilograms. This, however, caused prices for new vehicles to rise substantially, offsetting consumer savings on gasoline. Further, the newer light-weight vehicles were more heavily damaged in accidents and were more expensive to repair which added to consumer's operating costs.

As cars became lighter, the probability of death or serious injury when an accident occurred increased for drivers. Risk-averse consumers responded by purchasing bulkier vehicles, specifically SUVs. With SUVs becoming more common on the road, the probability that an accident involves a heavier vehicle increased for small-car drivers, further raising the likelihood that an accident is serious or deadly. This provided even more incentive for motorists to switch to SUVs. The increased perceived safety of driving a heavier vehicle made SUV drivers less cautious (commonly referred to as *moral hazard*), leading to more fatal accidents caused by SUV owners (fatal for pedestrians, motorcyclists and small-car drivers, but also fatal for SUV drivers themselves). Of course, SUVs are subject to a less restrictive CAFE standard, which means their fuel costs are higher and they emit more pollutants than small cars. As SUVs replace small cars on US roads, fuel consumption, transportation costs for consumers, smog emissions and vehicular fatalities all rise.

In New Zealand, stricter emissions standards were set for imported vehicles in January, 2008. This policy is expected to have a different impact on New Zealand drivers than CAFE had in the United States. The stricter standard should reduce the number of older vehicles being imported into the country. Since newer vehicles are both safer and more fuel efficient, we would expect a reduction in vehicle fatalities, less pollution and lower transportation costs (at the expense of higher prices for automobiles). But will there also be an invasion of SUVs? Only time will tell.

Interested in vehicle emissions policy and the changing characteristics of the vehicle fleet? See page 14 for references and further reading.



# Keeping your eye on the prize: 2009 Nobel Awards in Economics

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Elinor Ostrom and Oliver Williamson are the joint winners of the 2009 Nobel Prize in Economic Sciences. The official press release announcing their award states that they won the prize for their “analysis of economic governance” (The Nobel Foundation 2009). Ostrom is recognised for her work on common property resources while Williamson is recognised for his work on the boundaries of the firm. This article summarises the contribution of both Elinor Ostrom and Oliver Williamson and how their research enhances our understanding of economic governance.



## **Elinor Ostrom: When the tragedy of the commons isn't really a tragedy at all**

Traditional economic theory predicts that if there is open access to a resource it is likely that this resource will be over-used. Resources that have open access are known as “commons goods” or “common property resources”.<sup>3</sup> A good example is commonly-owned grazing land. Imagine a village with commonly-owned land, on which any member of the community can graze their cattle for free. In addition to the commonly-owned land, farmers also have privately-owned land they can graze their cattle on, but must pay the costs associated with maintaining the field. All farmers realise that it is not a good idea to let too many cattle graze on the communal land as too much grass will be eaten which may not grow back. This may lead to erosion and the land becoming useless for grazing in the future. Hence, overgrazing of communal land is not in the interests of society as a whole. However, there are large incentives for each individual farmer to graze their cattle on the communal land so long as they do so before anyone else's cattle eat the grass there. If all farmers act out of self interest, they will rush to graze their cattle on the communal land and the quality of the communal field will be compromised. This situation is known as the “tragedy of the commons”.

Economists have traditionally thought that the way to avoid the tragedy of the commons is for the government to clearly assign the property rights to only one individual. This individual will then have the incentive to use the grazing land in a sustainable manner, and not let too many cattle on the land at once. Another alternative would be for government to manage the resource, but this option is rarely favoured by economists with neoclassical tendencies.

Elinor Ostrom's research has shown that in the real world, as opposed to the world described by economics textbooks, many societies have come up with ways of avoiding the tragedy of the commons without recourse to either the government assigning property rights or the government managing the resource. By looking at how commons goods such as fisheries, grazing lands, forests and irrigation systems are managed in many different societies around the world, Ostrom found that local communities often devise their own mechanisms for managing resources, without any input from central government.

Many examples of community-based solutions to the tragedy of the commons are documented in her seminal book *Governing the Commons: The Evolution of Institutions for Collective Action*, which was published

<sup>3</sup> Strictly speaking, commons goods must also be rival. This means that if one person consumes the good, this prevents someone else from consuming it. Most goods are rival. Grazing land is rival in the sense that each blade of grass can only be eaten once.

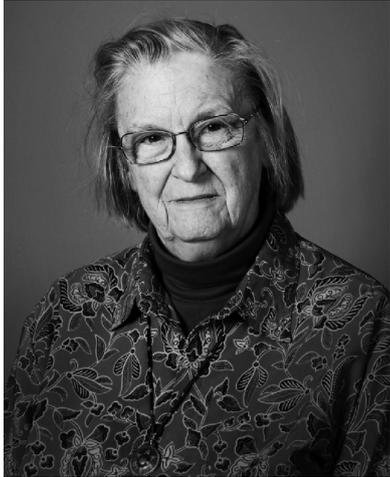


Photo: U. Montan, © The Nobel Foundation.

Elinor Ostrom

in 1990. Returning to the example of commonly-owned grazing land, she discussed a village in the Swiss Alps where rules and norms governing the use of common grazing land have evolved over centuries. For example, a regulation going back almost 500 years requires that no farmer may send more cows to graze on communal land in the summer than the farmer can feed in the winter from private stocks of fodder (this is known as the “wintering rule”). All villagers who own cattle belong to an alp association, which elects officials who are responsible for fining members who break the wintering rule, who arrange for the distribution of manure on communally-owned pastures and who oversee other maintenance work. The key point to note is that this is a local grass-roots institution that has evolved over a long period of time to manage a communal resource. The resource is not privately owned, and it is not managed by the government.

Elinor Ostrom is the first woman to be awarded the Nobel Prize in Economics. Born in 1933, she received a BA (with honours) in political science from UCLA in 1954 and went on to graduate with an MA and PhD in political science from UCLA. She is currently a Professor at Indiana University. Her key research contribution has been to show that the world does not always behave in the way that economic theory, at least as presented in most first-year textbooks, would suggest. The commons are often effectively governed by community-based institutions, or the evolution of commonly accepted norms, rather than by private ownership or the heavy hand of government. The existence of open access does not always lead to the tragedy of the commons.

### Oliver Williamson: Transactions costs and the creation of the firm.

Much of the theory of the firm in conventional neoclassical economics takes the existence of the firm as given, and focuses on the decisions it makes to maximize its profits (such as choosing quantities of inputs, output and what prices to charge). Conventional analysis emphasizes how efficient outcomes are arrived at by transactions in decentralized competitive markets with decisions based on relative prices. In reality, firms, especially large firms, are complex hierarchical structures with decisions based on rules and authority.

But why do firms exist at all? An answer was proposed by Ronald Coase (1937). Exchanging goods, services or assets involves transactions costs, including the costs of negotiating and enforcing contracts. Coase argued that firms emerge when transactions costs are lower within a firm than if the transactions occur in a market between individual self-employed agents. In other words, if it is cheaper to ‘internalize’ transactions costs within the organizational structure of a firm than it is to conduct the transactions independently, agents will prefer to use firms and therefore firms will materialize.

However, it is not sufficient to say that whatever organizational outcomes we observe within existing firms must be those with lower transactions costs. Williamson developed Coase’s ideas by identifying the characteristics of transactions better suited to internalization within the firm than to independent market activity. An essential aspect of any transaction is resolving conflicts of interest between the parties involved. Markets and hierarchical firms provide different coordination structures for resolving conflicts and each has different strengths and weaknesses. Williamson explained that the more complex or non-standard the transactions, then the higher are the resulting transactions costs.



Photo: U. Montan, © The Nobel Foundation.

Oliver E. Williamson

Consider the transactions costs involved in a simple one-off sale or purchase in a farmers’ market. Conflicting views on price can be resolved through haggling or by seeking a more acceptable price from other sellers/buyers. The transactions cost of such simple trades are low and markets usually work well. Problems can arise, however, in situations that are more complex. For example, producers of a complicated product that involves multiple processes and many components (such as a car or a passenger airliner) would find it much more costly to arrange ongoing contracts for timely delivery of all the relevant inputs from a large number of specialized suppliers. In such complex situations, it is impossible to account for all contingencies in formal contracts between the different parties (the ‘incomplete contracts’ problem). If input modifications or design changes to the product take place, which are almost inevitable, this would affect the rest of the production process and existing contracts with input suppliers would need to be renegotiated. In

such situations, transactions costs can be minimized by integrating production of the various components within the single firm (called 'vertical integration').

Williamson also predicts that internalization is more highly favoured if the mutual dependence between the transacting parties is great. For example, a supplier that produces a project-specific component for an aircraft manufacturer is not in a strong bargaining position because not many other manufacturers are interested in purchasing their product. After this supplier makes the initial investment to produce the input, the aircraft company may turn around and demand a higher share of the profits if contracts have to be renegotiated for any reason (i.e. due to the 'incomplete contracts' problem). The risk associated with such relationship-specific investment can reduce the incentive to invest in the know-how and physical capital required for the production of such intermediate inputs in the first place (known as the 'hold-up' problem). Vertical integration of component manufacture and component assembly within a single firm avoids such problems.

In recent times, with increased globalization, 'outsourcing' has become more common. Outsourcing involves replacing a previously internalized transaction with a market transaction. However, in line with Williamson's prediction, this may not always be optimal. A much-cited example (Lahart, 2009; Tadelis, 2009) is that of Boeing's delayed production of its 787 Dreamliner aircraft, for which much of the manufacturing was outsourced in contrast to Boeing's previous reliance on in-house production. With outsourcing, Boeing found that it was not able to react as efficiently to unforeseen problems that required design changes and long delays ensued. Its response was to cancel contracts and reintegrate some of the component manufacturing processes for the new aircraft, including buying the manufacturing company responsible for producing the fuselage.

Oliver Williamson was born in 1932. He received a Ph.D. in Economics in 1963 from Carnegie Mellon University. He is currently the Edgar F. Kaiser Professor Emeritus of Business, Economics and Law and Professor of the Graduate School at the University of California, Berkeley.

Williamson's work has shaped a whole research agenda broadening our understanding of the different mechanisms for achieving efficient coordination of economic activity, with practical policy implications for antitrust regulators (on the merits or otherwise of mergers), businesses (on outsourcing, vertical integration, and debt versus equity choices) and local and national government (on choices between service provision and privatization).

#### Useful websites

Further information on the Nobel Prize in Economics is available at [http://nobelprize.org/nobel\\_prizes/economics/](http://nobelprize.org/nobel_prizes/economics/).

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## OTAGO UNIVERSITY PRIZE WINNERS IN ECONOMICS

### WINNER OF THE ERKIN BAIRAM MEMORIAL PRIZE FOR 2009: SAMUEL STRUTHERS

In memory of the life of Professor Erkin Bairam (1958-2001) and his many contributions to the Department of Economics and the University of Otago, the Erkin Bairam Memorial Prize is awarded annually to the student with the highest marks across the core third-year honours Economics papers. Born in Cyprus, most of Erkin's working life was spent in the Department of Economics at the University of Otago. At the age of 33, he became one of the youngest full professors to be appointed in New Zealand and by the time of his death had published over 60 articles and 4 books. The winner for 2009 is Samuel Struthers (past winners: Aaron Carson, 2003; Madeline Penny, 2004; Ashley Dunstan, 2005; Christopher McDonald, 2006; Tom Graham, 2007; Hugh McDonald, 2008).

### WINNER OF THE SOPHIE KATE ELLIOTT MEMORIAL PRIZE FOR 2009: HUGH MCDONALD

In memory of the life of Sophie Elliott (1985-2008), the Sophie Kate Elliott Memorial Prize is awarded annually to the fourth-year Honours student with the highest overall grades. After completing a First Class Honours degree in Economics in 2007, Sophie Elliott was due to start her career at the New Zealand Treasury in Wellington but was tragically murdered in January 2008. Sophie was an outstanding scholar and was well-known and respected within the Department of Economics at the University of Otago. The winner for 2009 is Hugh McDonald (past winners: Tom Graham, 2008).

## HIGHLIGHTS:

## PASSENGER PIGEONS PASSING US BY

At one time, the passenger pigeon was one of the most numerous bird species in North America. When roosting, they piled into treetops and bushes covering areas up to 5 km wide and 65 km long. Their migration was even more impressive. Numbering in the billions, flocks of passenger pigeons could spread out over spaces 1.5 km wide to 500 km long, often taking several hours (or even days) to pass over. Vastly outnumbering most natural predators and requiring large numbers to successfully reproduce, this species flourished primarily because of its sheer scale.

The last passenger pigeon died in the Cincinnati Zoo in 1914. How did this once-thriving species land on the road to ruin?

Many believe the extinction of the passenger pigeon is a famous example of the *tragedy of the commons*. Like many natural resources, these birds could be freely hunted in the wild. In their large numbers, they were a *non-excludable* good (you couldn't charge a price for a pigeon since anyone who wanted one could go out and get one). They were also a *rival good* (once you've killed one, it's gone forever). Goods that are rival but non-excludable (called '*common property resources*') are often overused. In the case of the passenger pigeon, in order to own one you had to kill one. If you didn't snare your pigeon when the opportunity presented itself, it might not be there later as other hunters are also on the prowl. Hunters, therefore, hunt too much. The size of passenger pigeon flocks declined severely as European settlers hunted them as a cheap source of food (often for the poor and for slaves during the 19th century). With no longer enough numbers to fruitfully reproduce, the passenger pigeon slipped quickly into extinction.

In New Zealand, the plight of the passenger pigeon resembles the experience of the moa. As large as 2 metres tall and weighing as much as 250 kilograms, these giant birds were a rich source of protein for early hunters. The moa, however, had a fairly low reproductive rate and took a relatively long time to reach maturity. They could not increase their numbers fast enough to compensate for hunting losses in order to maintain a thriving species. The moa reached extinction in as little as 100 years after the arrival of humans in New Zealand, disappearing in the 14th century. In modern times, New Zealanders are aware of the tragedy of the commons and have responded to the dwindling availability of public goods (such as marine resources in our coastal fisheries) by implementing legislation designed to ensure their sustainability and preservation. The question researchers and policy analysts continue to ask themselves is "can we do better?" as new ways to manage our public resources are continually proposed and evaluated.

Interested in the tragedy of the commons and wildlife extinction? See page 14 for references and further reading.



# Commentary on the New Zealand economy

Alan King

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	Sep 2009	Jun 2009	Mar 2009	Dec 2008	Sep 2008
GDP (real, annual growth rate, %)	-2.2	-2.1	-1.4	-0.1	1.5
Consumption (real, annual growth rate, %)	-0.4	-0.4	0.1	0.8	1.7
Investment (real, annual growth rate, %)	-20.5	-14.9	-6.5	-0.3	3.1
Employment: full-time (000s)	1657	1666	1683	1702	1700
Employment: part-time (000s)	497	502	496	508	494
Unemployment (% of labour force)	6.5	6.0	5.0	4.7	4.3
Consumer Price Inflation (annual rate, %)	1.7	1.9	3.0	3.4	5.1
Food Price Inflation (annual rate, %)	5.4	7.5	8.8	9.4	9.5
Producer Price Inflation (outputs, annual rate, %)	-2.1	2.1	6.5	9.9	9.8
Producer Price Inflation (inputs, annual rate, %)	-5.8	-1.2	4.7	9.7	13.6
Salary and Wage Rates (annual growth rate, %)	2.1	2.9	3.4	3.6	3.9
Narrow Money Supply (M1, annual growth rate, %)	1.4	-2.6	2.5	3.0	0.7
Broad Money Supply (M3, annual growth rate, %)	2.7	2.8	6.8	6.5	6.9
Interest rates (90-day bank bills, %)	2.77	2.78	3.24	5.23	7.95
Exchange rate (TWI, June 1979 = 100)	64.3	60.3	53.8	55.1	63.8
Exports (fob, \$m, year to date)	41,592	43,028	43,353	42,900	41,973
Imports (cif, \$m, year to date)	43,125	46,139	48,037	48,514	47,022
Exports (volume, June 2002 [not seas. adj.] = 1000)	1148	1136	1058	1038	1044
Imports (volume, June 2002 [not seas. adj.] = 1000)	1426	1400	1407	1559	1667
Terms of Trade (June 2002 = 1000)	1061	1074	1182	1218	1230
Current Account Balance (% of GDP, year to date)	-3.1	-5.6	-7.9	-8.7	-8.4

Sources: Statistics New Zealand ([www.stats.govt.nz](http://www.stats.govt.nz)), Reserve Bank of New Zealand ([www.rbnz.govt.nz](http://www.rbnz.govt.nz))

Twelve months into the Global Financial Crisis and all measures of inflation are well down on their levels of a year ago. This is to be expected, but the figures are not what they seem. Rather than reflecting the broad-based decline in inflationary pressure that one might anticipate from a recession, the fall in the rate of Consumer, Producer and Food Price inflation are in large part driven by changes in the prices of just a handful of goods, not all of which are recession related.

The main contributors have been the collapse of world dairy and oil prices, and the largely weather-related declines in wholesale electricity and fresh vegetable prices. In fact, if one were to strip out the effect on the CPI of fuel prices alone, its September inflation rate would be a mere 0.6% below its pre-crisis level and, at 3.1%, just outside the RBNZ's target band.

With dairy and oil prices having rebounded from their post-crisis lows, electricity prices poised to rise should next winter be a trifle dry and food prices also at the mercy of the weather, it would seem that the RBNZ should be concerned about the prospects for inflation in 2010. It perhaps isn't surprising that financial markets have been expecting interest rates to be raised earlier than Alan Bollard has indicated.

The RBNZ's view is that it can safely delay raising the Official Cash Rate (OCR) because other factors (including the dollar's recovery through the second half of 2009, the relatively high level of longer term interest rates and a reluctance on the part of both banks and households to add to the latter's level of indebtedness) will keep a lid on demand and hence inflationary pressure for the time being. In addition, the large gap between floating and fixed-term mortgage interest rates that emerged in 2009 has persuaded many households to switch to the former, which means that future OCR changes will impact on household budgets and behaviour more rapidly than would otherwise have been the case.

The RBNZ currently anticipates that inflationary pressure will not build to the point where higher interest rates become necessary until the second half of 2010. This view in part reflects an assumption that the economy will begin 2010 growing at an annualised rate of over 3.5%, rising to 4.5% by year's end. Treasury's view (as expressed in December's *Half Year Economic and Fiscal Update*) is a little more cautious, but it also expects the economy to soon return to its pre-crisis average rate of growth. Both views may prove to be somewhat optimistic.

## HIGHLIGHTS:

## REFERENCES AND FURTHER READING

All *Highlights* in this issue were provided by Dan Farhat, dan.farhat@otago.ac.nz.

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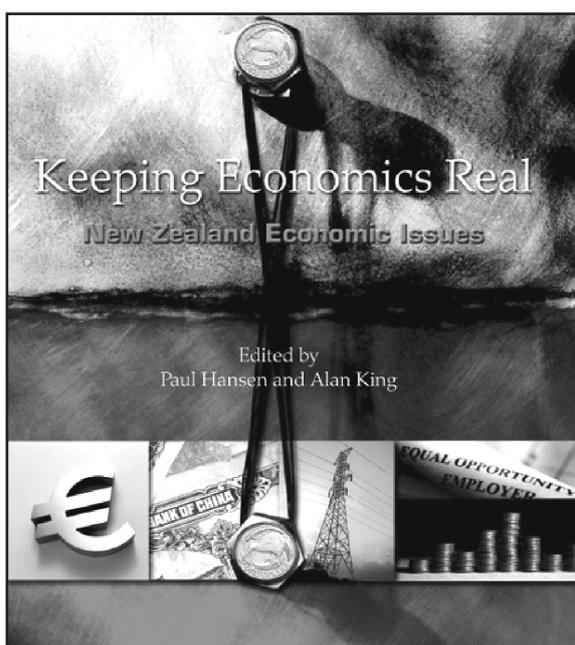
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